Remarks

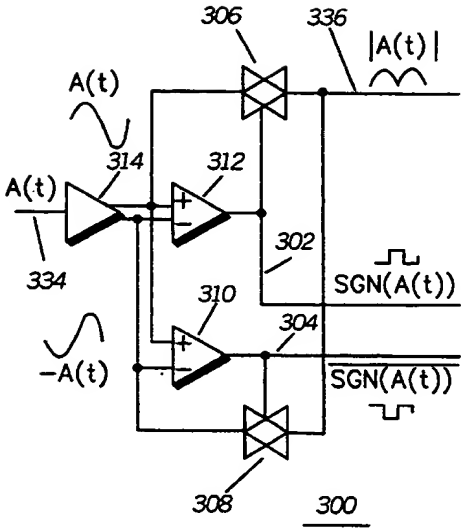
Status of Claims

Claims 1-20 are pending in the application. Claims 1, 4, 6, 8, 9, 11, and 14-20 stand rejected as allegedly being anticipated by or obvious over U.S. Patent No. 5,442,317 (Stengel), and all other stand objected as depending from a rejected claim but otherwise containing allowable subject matter.

Stengel

Stengel discloses a switching voltage regulator 200 (Figure 2) and several switching audio amplifiers 300, 400 (Figures 3 and 4). Functionally, those amplifiers 300, 400 extract a full-wave rectified signal $|A(t)|$ (denoted 336 in Figure 3 or 416 in Figure 4) and commutation timing information from the input signal $A(t)$. That commutation timing information is used to control which field-effect transistors 324, 236, 328, 330 (Figure 3) or 424, 426, 428, 430 (Figure 4) are turned on to draw the full-wave rectified signal $|A(t)|$ through the load 322 (Figure 3) or the speaker 422 (Figure 4). The full-wave rectified signal $|A(t)|$ is scaled by a factor a either continuously (Figure 3) or discretely (Figure 4) to provide variable gain.

Stengel's input circuit is the same in both Figure 3 and Figure 4 and will be discussed hereafter with reference to Figure 3 only, for simplicity and clarity. This input circuit consists of an op amp 314 followed by two comparators 310 and 312 in parallel. The comparators 310 and 312 produce rail-to-rail output "sine" [sic, sign] signals that are complementary to one another: $SGN(A(t))$ and $\overline{SGN(A(t))}$. (According to the description of these signals, Stengel's figures appear to incorrectly show the input connections on the comparator 310; as shown, its output would be identical to that of the other comparator 312; it appears that the input connections to the op amp 310 should be reversed.) Those "sign" signals are used to alternately turn on digital switches 306 and 308 to produce the full-wave rectified signal $|A(t)|$. This portion of Stengel's Figure 3 is reproduced below:



Claim 1

Claim 1 reads as follows:

1. A circuit for processing a received audio signal including an input stage for receiving the received audio signal and an output for presenting a processed audio signal, comprising:

a signal source providing the received audio signal having positive and negative wave portions;

first and second input stages having substantially identical nonlinear performance curves, the first input stage receiving the received audio signal, and the second input stage receiving an inverse of the received audio signal, the first and second input stages having operating characteristics selected such that of the positive and negative wave portions, one of the portions is processed substantially nonlinearly and the other of the portions is processed substantially linearly; and

a difference amplifier receiving the processed portions from the first and second input stages and producing the processed audio signal.

In rejecting claim 1, the Office action has read the claimed "first and second input stages" on Stengel's two comparators (310 and 312 in Figure 3, for example). While it may be true that Stengel's input signal $A(t)$ is a "received audio signal having positive and negative wave portions," that the comparators 310 and 312 are "input stages," that they have "substantially identical nonlinear performance curves," and that "the second input stage receiv[es] an inverse of the" signal received by the first input stage (assuming that comparator 310 has its inputs wired as described in Stengel's text rather than as shown in his drawings), it does not follow that the remainder of the claim limitations are met by Stengel. In particular, Stengel does not disclose that the two comparators 310 and 312 can be configured "such that of the positive and negative wave portions, one of the portions is processed substantially **nonlinearly** and the other of the portions is processed substantially **linearly**." Stengel certainly does not disclose that his comparators 310 and 312 have "operating characteristics selected such that" the above-recited condition can be satisfied. Indeed, nothing in the Office action's statement of the rejection even mentions the above-recited condition. Rather than having this capability, Stengel's circuit apparently processes the positive and negative wave portions of the input signal $A(t)$ identically (albeit in reverse polarity) both in the comparators and thereafter in the form of the "sign" signals and the full-wave rectified signal. Unless and until the Office can show that Stengel discloses the above-quoted limitation, the rejection must be withdrawn.

Furthermore, the Office action has not met its burden to shown that Stengel discloses the "difference amplifier receiving the processed portions from the first and second input stages and producing the processed audio signal" recited in claim 1. Although the rejection states that the Stengel's "amplifier itself functions as a difference amplifier," that – even if true – does not suffice to show this limitation. First of all, nothing in the cited passages from Stengel support this conclusion, and it is not clear what "amplifier itself" the rejection is referring to. If the Office action intends to refer to Stengel's overall amplifier 300 or 400, then the rejection is nonsensical because the recited "difference amplifier" receives signals "from the first and second input stages"; it does not make sense for an overall amplifier to receive its input from an earlier stage of itself. If the Office action intends to refer to Stengel's op amp 314, then the rejection is flawed because the recited "difference amplifier" "produc[es] the processed audio signal" – which the op amp 314 does not. If the Office action intends to refer to something in Stengel's circuit after the comparators 310 and 312

and the digital switches 306 and 308, then it is not clear what that something else could be, as neither the DC-to-DC converter 316, level shifter 320 or speaker bridge network is a "difference amplifier." Similar observations apply to Stengel's Figure 4. Unless and until the Office can show that Stengel discloses the "difference amplifier" limitation, the rejection must be withdrawn.

Claim 11

Claim 11 refers to "processing the first polarity portions of the input signal and the inverted signal substantially linearly" and "processing the second polarity portions of the input signal and the inverted signal substantially nonlinearly." The Applicants submit that claim 11 is allowable for reasons similar to the ones presented above with regard to claim 1.

Claim 11 also refers to "forming a difference between the processed input signal and the processed inverted signal, thereby generating a difference signal." The Applicants submit that claim 11 is allowable for reasons similar to the ones presented above with regard to claim 1.

Claim 16

Claim 16 refers to "a means for processing the first polarity portions of the input signal and the inverted signal substantially linearly" and "a means for processing the second polarity portions of the input signal and the inverted signal substantially nonlinearly." The Applicants submit that claim 16 is allowable for reasons similar to the ones presented above with regard to claim 1.

Claim 16 also refers to "a means for forming a difference between the processed input signal and the processed inverted signal, thereby generating a difference signal." The Applicants submit that claim 16 is allowable for reasons similar to the ones presented above with regard to claim 1.

Conclusion

The Applicant submit that the application is condition for allowance and respectfully requests a Notice of Allowability. If the Examiner has any concerns about the application, or if the undersigned attorney can assist in expediting the allowance of the application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

Red Chip Company Ltd.

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